1. $X = ABC + A\overline{B}C + \overline{A}$

   **Jawab:**

$$\begin{aligned} X &= ABC + A\overline{B}C + \overline{A} \\ &= AC(B + \overline{B}) + \overline{A} \\ &= AC + \overline{A} \\ &= \overline{A} + C \end{aligned}$$

2. $Y = AB\overline{(\overline{C}D)} + \overline{A}BD + \overline{B} \cdot \overline{C}D$

   **Jawab:**

$$\begin{aligned} Y &= AB\overline{(\overline{C}D)} + \overline{A}BD + \overline{B} \cdot \overline{C}D \\ &= AB(C + \overline{D}) + \overline{A}BD + \overline{B} \cdot \overline{C}D \\ &= ABC + AB\overline{D} + \overline{A}BD + \overline{B\overline{C}}D \\ &= ABC + AB\overline{D} + D(\overline{A}B + \overline{B\overline{C}}) \end{aligned}$$

3. $Z = (B + \overline{C})(\overline{B} + C) + \overline{(\overline{A} + B + \overline{C})}$

   **Jawab:**

$$\begin{aligned} Z &= (B + \overline{C})(\overline{B} + C) + \overline{(\overline{A} + B + \overline{C})} \\ &= B \cdot \overline{B} + BC + \overline{B} \cdot \overline{C} + \overline{C}C + A\overline{B}C \\ &= BC + \overline{B} \cdot \overline{C} + A\overline{B}C \\ &= A\overline{B}C + BC + \overline{B\overline{C}} \\ &= C(A\overline{B} + B) + \overline{B\overline{C}} \end{aligned}$$

4. $W = \overline{(AB\overline{(CD)})}$

   **Jawab:**

$$\begin{aligned} W &= \overline{(AB\overline{(CD)})} \\ &= \overline{(AB(\overline{C} + \overline{D}))} \\ &= (\overline{A} + \overline{B} + (CD)) \\ &= \overline{A} + \overline{B} + CD \end{aligned}$$

5. $S = (\overline{A} + C)(A + C + B)\overline{B}$

**Jawab:**

$$\begin{aligned} S &= (\overline{A} + C)(A + C + B)\overline{B} \\ &= (\overline{A} + C)(A\overline{B} + \overline{B}C + B\overline{B}) \\ &= (\overline{A} + C)(A\overline{B} + \overline{B}C) \\ &= A\overline{A}\overline{B} + \overline{A}\overline{B}C + A\overline{B}C + \overline{B}CC \\ &= \overline{B}C + \overline{B}C \\ &= \overline{B}C \end{aligned}$$